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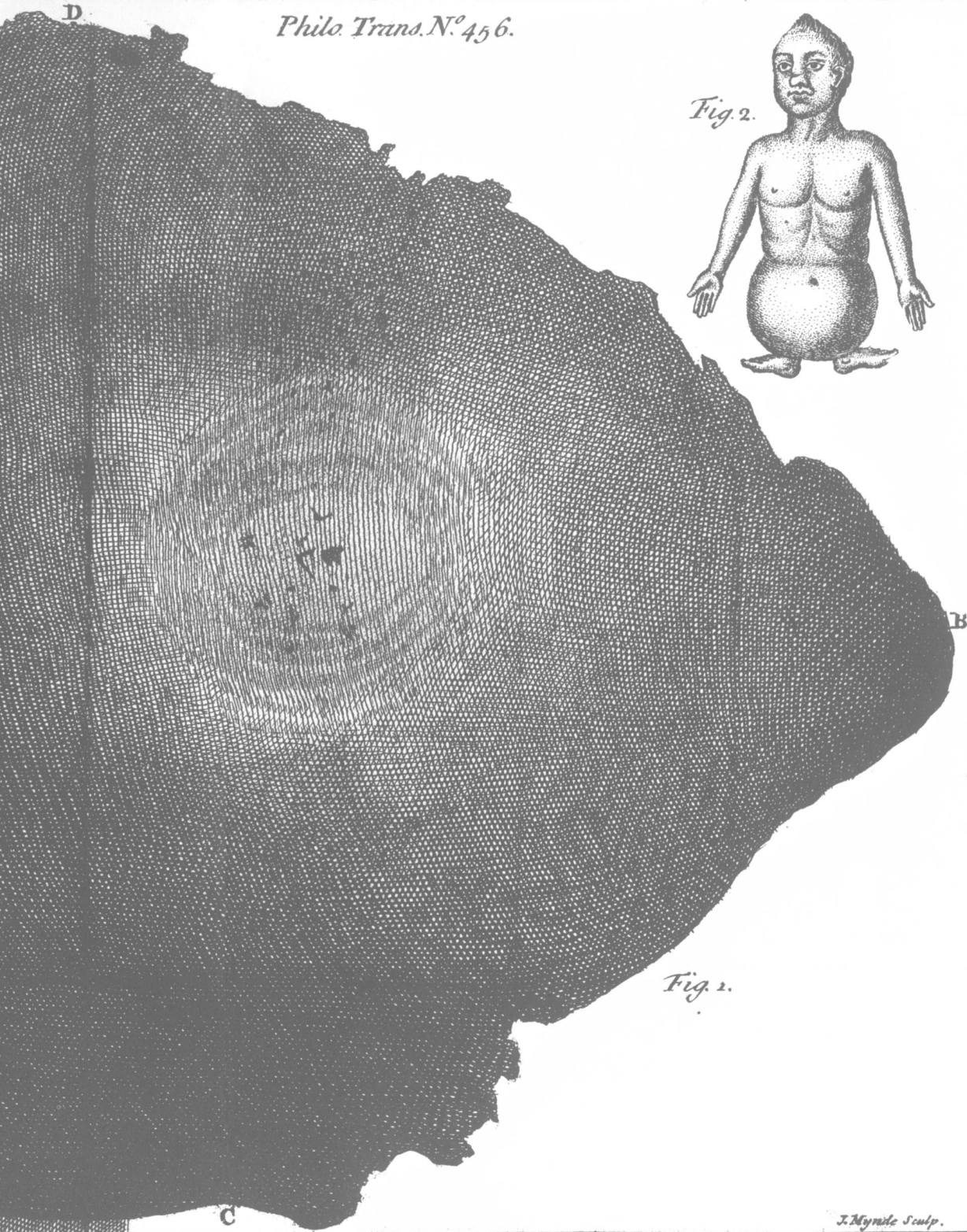
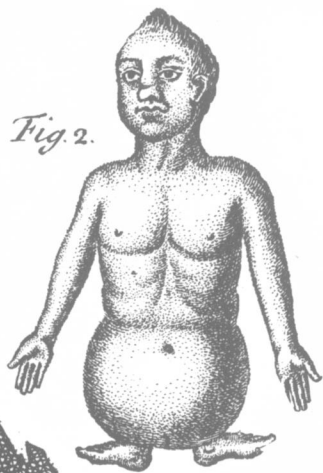
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TAB. II.

Philos. Trans. N.º 456.





845. Stramonium; foliis subrotundis sinuatis & denticularis.
 846. Thapsia latifolia, villosa. C. B. 348.
 847. Verbena Bonariensis, altissima; Lavendulæ Canariensis spica multiplici. H. Elt.
 848. Virga aurea Marilandica, cæsia, glabra. H. Elt. 414.
 849. Virga aurea Novæ Angliæ, lato, rigidoque folio. Par. Bat.
 850. Virga aurea, vulgaris, latifolia. J. B. II. 1062.
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II. *Some Reflections on Generation, and on Monsters, with a Description of some particular Monsters: By Daniel de Superville, Privy Counsellor and chief Physician to his most Serene Highness the Margrave of Brandenburg-Bareith, President of the College of Physicians, Director of the Mines and of all Medicinal Affairs in the Margravite, Member of the Imperial Academy Naturæ Curiosorum, and of the Royal Society of Berlin. Translated from the French by Phil. Hen. Zollman, F. R. S.*

IT cannot be denied, that since the middle of last Century to this Time, very important Discoveries have been made in Natural History: However, those Discoveries are very insignificant, in comparison to what is still concealed from us. We have some
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Knowledge of the coarser sort of Nature's Operations, but the Niceties, the Particulars of them, escape us. If we endeavour to push our Knowledge so far, we find ourselves surrounded with Clouds, we grope in the dark, and it is very difficult, if not impossible, to catch Nature in the Fact. It even seems, we have had better Success in determining what Nature does not do, or cannot do, than in specifying what she actually does.

The Human Body is a Compound of Springs, which produce very regular Motions: Yet these Springs themselves we do not know but very superficially, and are far from knowing how those Motions are produced. We know, that we are born, that we exist; but how came we to this Existence? How were we produced? The Generation of Mankind and of Animals is one of those *Phænomena*, where innumerable Experiments have not been of so great Use, as they are else in other *Phænomena* of Natural Philosophy, for discovering their most secret Springs.

It is still a Dispute, whether the Male or the Female contributes most towards Generation. It is certain, that for the Generation of Mankind there must be a Male and a Female, and it is the same thing with regard to that of Brutes. There is all the Reason in the World to believe, that what is written about Hermaphrodites, and about those Animals which, being endued with the Advantage of the two Sexes, produce alone their Like, has not been examined with all the necessary Attention and Exactness.

The *Semen* of Man, which is certainly a most necessary Agent for Generation, because it has been

observed, that those who have none, or do not eject it according to certain requisite Conditions, are not fit for multiplying their own Species: This *Semen*, I say, is a Liquid full of small Worms. It would be absurd to deny it: All exact Observators have taken Notice of them, and offered to shew them to the incredulous. I have observed these *Animalcula* in human *Semen*, in that of several Quadrupedes, and in that of some Birds. I have observed, that the Figure of these *Animalcula*, as to Birds, was different from that of other Animals. I have preserved *Animalcula* in a proportionable Warmth alive for several Hours; I have observed their Strength and Liveliness to lessen by Degrees, and at last intirely to cease; and I have observed them dead, not swimming any longer, but always sinking to the Bottom. I have observed in the *Semen* of Men, who had a virulent *Gonorrhœa* upon them, those *Animalcula* to be without Motion, and like dead. I might enlarge upon the Particulars of a greater Number of Observations; they all prove the real and constant Existence of *Animalcula* in the *Semen* of Males.

These Worms, according to some Natural Philosophers, are true *Embryoes*. As soon as an *Animalculum* has entered into an Egg, the Female who carries the Egg in her Body, has conceived; she harbours it, nourishes it, and contributes towards the shaping of it, until it becomes an Animal, too big to be any longer contained in so small a Place, and strong enough to bear the Air.

According to other Natural Philosophers, the Eggs that are in the *Ovaria* of the Females, contain the Image, the Type, the Picture of the *Embryo*; and the
subtile

subtile Vapour of the Male *Semen*, or rather the occult Quality of that Seed, impregnating one of those Eggs, immediately fixes that Image, and makes a real *Embryo* of it.

These latter intirely deny the Existence of *Animalcula* in the Seed, because they have not seen them; and if they are shewn them, they maintain that they are foreign Beings; or, that they are a particular sort of Worms, who form a separate Class among those Insects: That God created them to exist in the Seminal Liquid, that they keep in it as in their Element, that they multiply there, and that they continue there and die, such as we observe them by the Microscope.

I do not pretend to decide, that the former are intirely in the Right; they maintain an Hypothesis founded on some Probabilities. Alas! who can hope upon so dark and hidden a Subject to find a demonstrated System? The second Opinion seems to me unwarrantable: It is founded upon Words which have no Reality. How can one form to himself the Idea of a Vapour extremely subtile and active, that shall have the Faculty of giving Life and Motion to an Image, to a Type, in short, to a thing that was not real? The Pre-existence of the *Embryo* in the Egg can by no means be demonstrated: Even by the Help of the best Microscopes, there is never any thing found in those Eggs, but a clear and limpid Liquid.

I keep among my Curiosities six ossified Eggs, which I found in the *Ovaria* of a Woman who died at the Age of Sixty. They are not all of the same Bigness. I broke two of them, and examined
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their internal Structure with all the Attention imaginable; but found nothing there except officous Fibres, issuing from the Centre towards the Superficies; there was not the least Appearance of an *Embryo*, nor of its Image.

One must have an Imagination extremely prepossessed to persuade one's self, that there is an organized Body in the Liquid contained in those Eggs: Or, it requires a very particular Natural Philosophy, to pretend to demonstrate, that a bare Vapour (more subtile than any the most spirituous Vapours we know of) could, by its simple Touch or Friction, produce an organized Body, where there was none.

The Generation of Mankind as well as of Brutes by the means of the *Animalcula*, which are observed in the *Semen* of Males, seems more analogous to all that we see Nature do for the Production and Multiplication of the Vegetables. There needs no Imagination for forming to one's self an Idea of it. Each *Animalculum* is an *Embryo*, is a small Animal of the same Species with that which harbours it: As soon as it finds itself disengaged from the Confinement in which it was, and in a Place where it meets with a Humour proper for its Vegetation and Expansion, it takes Root there, it swells like a Corn newly put into the Earth, it spreads itself, its Members shape themselves, and by degrees take more Strength and Consistence, its Parts grow longer, and disentangle themselves, as it were, from all those Plaits and Folds in which they were confined before, and the *Embryo* becomes a *Fœtus*.

I own, that the immense Number of *Animalcula*, which are observed in the Seminal Liquid of Man, seems

seems to oblige one to reject this Hypothesis, and particularly this Opinion, that every *Animalculum* is an *Embryo*. For it is certain, that in every Man there would be enough of them to people a vast Country, and of all that immense Quantity there are but a few that come to any thing. And so, there you have Millions of little Men, created never to exist; which seems directly contrary to the wise Intentions of the CREATOR, who, in all Likelihood, made nothing in vain. But *Teleology* is one of those Parts of Philosophy, in which there has been but little Progress made, wherein one reasons only by Conjecture, nor can demonstrate any thing otherwise than *à posteriori*. Who dares presume so far as to pretend to penetrate into all the Designs of the ALMIGHTY, and into the divers Ends He has proposed to Himself in the Creation of the Universe? Besides, it is certain, that half of Mankind perish, before they come to the Age of one Year, that is to say, before they can know themselves, before they can answer the Ends God proposed to Himself when He created them. Would one say therefore, that their Existence was useless? But moreover, this seemingly useless Quantity of *Animalcula* equally affords an Argument against the Hypothesis of those, who believe the *Embryo* is in the Egg. One cannot maintain, that all the Eggs in the *Ovaria* are fruitful. And so there we have equally an immense Quantity of Types of *Embryo's* created for nothing, and absolutely useless; and it will follow from both Hypotheses, that God might have saved Himself the Trouble of creating so prodigious a Quantity of Creatures in order to precipitate them into nothing. But who

dares say, that the creating so many Millions of Creatures more has cost Him any more Pains? And by what could one prove, that all those *Animalcula*, which do not come to the State of a *Fœtus*, are annihilated?

The Hypothesis of the Generation by *Animalcula* in the Seminal Liquid of Man, appears supported and confirmed by several Experiments. *Leewenhoek* has already observed, that a wild Male Rabber, and a tame and white Female, produce young ones intirely resembling the Father; and that it is a Cheat very common in *Holland* to sell that sort of Rabbits, for wild ones, and that it is only by the Taste one can find out the Truth. There is among domestic Animals a sort of Poultry without Tails, and another sort with the Feathers turned upwards; if a Cock without a Tail is put among ordinary Hens, or a Cock with the Feathers upwards, all the Chicks will prove like the Cock: The same Experiment may be made with Pigeons, with Canary-Birds, &c.— A Mule sprung from an Ass and a Mare, resembles more to the Ass than to the Mare, whereas a Mule coming from a Horse and a She-Ass, has more of the Horse's Nature. All this proves in some measure, that the Male furnishes the most essential Part in the Generation, *viz.* the *Embryo*.

By the same Hypothesis some *Phænomena* observed in Generation, may be more easily accounted for. *Hippocrates* believed that the Difference of the Sexes depended on certain Dispositions in the Seeds of the Male and the Female; that when the Male was the most vigorous in the Copulation, they begot Males; but if the Seed of the Female prevailed, they produced

duced only Females. This Opinion, absurd as it is, has been followed and maintained by several celebrated Physicians. How can one believe, that a little more of I do not know what, (for they do not determine wherein the more or less of the Virtue in the Seed must consist) a little more Activity, a little more Spirituousness, should compose, should determine any Organization? It is more natural to believe, that every *Animalculum* has already the Sex it is to have when it comes into the World. It has been disputed Tooth and Nail, to determine the Time when the *Fœtus* becomes animated, and to know from whence and how its Soul enters into its Body. According to the most general Opinion, there must be at every Conception a new Creation of a Soul: Or, according to others, there is always a Legion of created Souls fluttering about in the Air, and watching the Minute for entering into a fruitful Egg as soon as it is impregnated. What an Extravagance is this! Would it be as absurd to believe, that every *Animalculum* has already its Soul, which waits only for the little Machine's unfolding itself in order to exert its Function?

According to the Hypothesis of *Animalcula*, one may easily account for those monstrous Births, when two *Fœtuses* are joined together, or Children and Animals are double, in the Whole or in Part. I keep in my Collection a Pig, that has eight Feet: the two Bodies, that are separated, reunite themselves by the *Spina Dorsi* below the *Diaphragma*, and have but one visible Neck supporting a Head, bigger than it should be, on which there appear four Ears, three Eyes, and the Snout seems double. I have also

the Head of a Foal, which is double, and has three Eyes. I have a *Turkish* Duck, which is double, the two Bodies are joined by the Breast; each Body has two Wings, and two Legs; but they have only one Neck with one Head. I keep a Chicken, which has a second Rump fixed to its Breast, with the two Legs, and two Paws. I even have a Frog, which besides its four Paws, has a Fifth as well formed as the others, which comes out at the Right Shoulder. The Production of all these Monsters that are double, or have superfluous Members, may very well be occasioned by two *Animalcula* entering into the same Egg; they touch, they close, they unite, they crowd each other: The Parts of the weakest, being too much crowded, cannot extend nor display themselves; so they vanish, as it were, so much the easier as they are extremely tender, and without any sensible Consistency.

It is not more difficult to find plausible Reasons for imperfect Monsters, or that have an odd Conformity, as to the Whole, or as to some of the Members. I have the *Fœtus* of a Sheep which has no Nose; the Part where the Nostrils should be, seems to be flayed, and the two Eyes are there one by the Side of the other. On the Forehead there is a small Trunk of about an Inch and a half long, and pierced at the End by two Nostrils. I have another, which has but one Eye in the Middle of the Forehead. I have a human *Fœtus* of about seven Months, which has no Mark of the Sex, and instead of the Legs there is a Bag that runs to a Point, the Extremity of which is cartilaginous: In that Bag there is a Bone three Inches long, covered with a muscular Flesh;
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it is articulated with the *Os Sacrum*; the *Ossa innominata* are wanting, and below the *Anus*, which is upon the Middle of the *Os Sacrum*, there is a small Tail like that of a Pig.

When I was at *Stetin* in *Pomerania*, about 12 or 14 Years ago, a Midwife came to tell me, that a Sergeant's Wife was delivered of three dead Children, one of which had no Head. I immediately went, and observed, that these *Fætuses* had died at different times. One began already to corrupt, and the *Epidermis* fevered itself at the least Touch. The Monster without a Head was also already quite flabby, and the third seemed to have died but a few Hours before. I examined the Monster; there was no Appearance of any Head, and instead of the Navel there was a small Lump of spongy Flesh of the Bigness of a large Strawberry. About the *Secundines* I found but two *Placentas*, and two Coats; so that this Monster must absolutely have been in one of those Coats with another *Fætus*. The Midwife was not skilful enough to give me an Account of the Delivery: I put Questions to the Mother, who assured me she felt one Child dying three Weeks before, and that the last died the Evening before. I offered a good Sum of Money to have all she was delivered of, but they would not let me have it. I still offered Money to have only Permission to dissect the Monster, but the impertinent Superstition of the Parents deprived me of that Satisfaction.

I still preserve in my Collection a monstrous *Fætus*, which deserves particular Attention. It is of eight Months, without Head or Arms: The Figure [See TAB. I. Fig. 1.] is here annexed, which outwardly

wardly seems to be nothing else but the *Abdomen* with the Legs; these are well-shaped and proportioned, with the Toes, and the Beginning of the Nails; the Right Foot however is, as it were, crooked, and bending inwards. Having opened it, I found indeed but one Cavity, which in the upper Part contains a small Bladder. There is not in all the Cavity any thing besides a Bit of Intestine, the two Kidneys, the Bladder, and the Right Testicle, which lay upon the Ring. The Flesh was hard, and, as it were, *carcinomatose*. The Navel-string went in a little higher than naturally, and a little towards the Right Side, entering into the Intestine. There is a slender Intestine of about 14 Lines in Length, proceeding from the same Place, where the Navel entered into the Cavity; next comes the *Cæcum* with its vermicular Appendix, the *Colon* and the *Rectum*, the Whole together of the Length of about two Feet. These Intestines go from above to below in *Zic-Zac*, and are attached to the *Spina Dorsæ*. There is no Footstep of the Heart, the Lungs, the Stomach, the Liver, the Spleen, the Pancreas, the Mesentery; all that is wanting. The small Bladder I mentioned was fleshy, and contained some Serosity; it is attached to the first of the *Vertebrae* of the Neck. This Beginning of the *Spina* is bent forwards like a Bow, and forms the Monster's Roundness from above. The bended Extremity kept the little Bladder, as it were, under, and shut up in the Cavity closed up by the Ribs. This Cavity was to form the *Thorax*, but the *Sternum* was wanting as well as the *Diaphragm*.

Descartes and *Lancisci* would in vain have looked out here for the Seat of the Soul, and the *Punctum Saliens* would prove very hard to be determined in this *Fœtus*. But I do not now intend to enlarge upon it. The Business is to find some plausible Reasons about the Origin of those sorts of Monsters I have now described.

The Opinions of most of the Natural Philosophers on this head may, upon the main, be reduced to these two Hypotheses: 1. That Monsters are original, that is to say, that even in Conception the Monster is conceived. 2. That they are not produced but by Accident. One may conclude from what I have said about double Monsters, that I believed them accidental; and I believe, rigorously speaking, they are so, whatever they be: For supposing every *Animalculum* to be an *Embryo* created, I cannot imagine them to be created imperfect! Their Imperfection, their Deformity, may proceed from a thousand Accidents, either in the *Reservoirs* where they are contained, or in the different Routs they are obliged to take going from Father to Son. In this Case it may easily happen, that they are Monsters, even in the Moment of Conception, though they be such by Accident. To how many Accidents are they not subject afterwards in the Venter of the Females? A Fall of the Mother, a strong Pressure, a Contusion, &c. may disorder the nice and tender Structure of that little Creature so far, that a great many of its Parts do not unfold themselves any longer, are destroyed, or have their Order and natural Situation intirely changed.

The disturbed and disordered Imagination of the Females ought also to be ranged among the accidental Causes of Monsters. I have seen in a Sow just slaughtered seven Pigs, which all had the bloody Mark of the Knife about their Necks. About some twenty Years ago, a Cloth-shearer in *Holland* had the Misfortune to fall into the Hands of some drunken young Fellows, who murdered him, and stabbed him with more than twenty Wounds with their Swords. He was to be married that very Week: His Sweat-heart saw his Corpse naked with all those Wounds, and was two Days after delivered of a dead Child, which had the Marks of the Wounds in the same Places of its Body, where the Mother had observed them on her dead Lover.

I very well know, that these sorts of Instances, of which one might alledge some Hundreds, will not go down with certain People, who deny the Effect of the Mother's Imagination on the *Fætus*. They lay Stress on two principal Reasons: 1st, It is pretended, that the *Fætus* has no immediate Connexion with the Mother who carries it. But this is ridiculous; for one cannot deny, that the *Secundines* are closely united to the *Matrix*, and receive from the Mother a Humour, or a Liquid, which by the Navel-string it remits to the *Fætus*. It is by that way it receives its Nourishment, that is to say, the Matter necessary for its Increase. Accordingly one may say, that the *Fætus* owes part of its Being to the Mother; and that the Liquid which runs in the Vessels of the Mother, runs likewise in the Vessels of the *Fætus*. 2^{dly}, It is said, that it is incomprehensible how the Soul of the Mother can have an Effect on
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the Child. I own I do not comprehend it neither. It does not follow from thence, that we ought to reject as false all that our Reason cannot penetrate into. When once the Existence and the Nature of the Soul has been demonstrated, when once we have a perfect Knowledge of the Manner how an immaterial Being acts upon Matter, we shall then reason in Consequence about what the Soul can do, and cannot do. Daily Observations demonstrate to us, that the disordered and disturbed Imagination of Women often hurts the Infants. And this is a Reason, which I add to all the others, to think I have good Grounds to conjecture, that all Monsters are accidental; and to believe, that by the Hypothesis of *Animalcula* one may better explain the *Phænomena* which are observed in Generation, than by any other Hypothesis known as yet.